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On normal τ-measurable operators affiliated with semifinite von Neumann algebras

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Abstract

© 2014, Pleiades Publishing, Ltd. Let τ be a faithful normal semifinite trace on the von Neumann algebra M, $1 \geq q > 0$. The following generalizations of problems 163 and 139 from the book [1] to τ-measurable operators are obtained; it is established that: 1) each τ-compact q-hyponormal operator is normal; 2) if a τ-measurable operator A is normal and, for some natural number n, the operator An is τ-compact, then the operator A is also τ-compact. It is proved that if a τ-measurable operator A is hyponormal and the operator A2 is τ-compact, then the operator A is also τ-compact. A new property of a nonincreasing rearrangement of the product of hyponormal and cohyponormal τ-measurable operators is established. For normal τ-measurable operators A and B, it is shown that the nonincreasing rearrangements of the operators AB and BA coincide. Applications of the results obtained to F-normed symmetric spaces on (M, τ) are considered.

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Keywords

cohyponormal operator, F-normed symmetric space, faithful normal semifinite trace, hyponormal operator, nilpotent, quasinilpotent, semifinite von Neumann algebra, τ-compact operator, τ-measurable operator